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IBM-1620 Monitor II-D Disk-Storage Subroutines

The problem:

To provide a FORTRAN user, working with large data sets, with relatively fast and random access to disk storage. The advantage of disk storage cannot be fully realized on a normal IBM-1620 Monitor II-D System because the RECORD and FETCH statements provide only temporary disk storage.

The solution:

A set of subroutines that provides the FORTRAN user with protected, permanent, disk storage of data on an IBM-1620 Monitor II-D System (ref. 1). The program, called the Second-Disk System, consists of a set of four subroutines and a utility program. It allows a block of data, containing any number of variables and/or arrays, to be transferred directly between assigned core locations and disk storage. Data can be stored on a user's own disk pack or on protected areas of a system pack.

How it's done:

The Second-Disk System requires the exclusive use of a second-disk drive and is entirely independent of normal Monitor disk operations. It is written for an IBM-1311 Disk Drive with a "direct seek" special feature that eliminates the waste of time associated with the normal return to home and seek from cylinder zero. The only restriction imposed by the Second-Disk System is that both fixed- and floating-point word lengths must be even.

The storage capacity of a disk pack (2,000,000 digits) is often large enough to serve many users. For mutual use, a physical disk pack is divided into logical disk packs called files. Each file is identified by a unique file number and is divided into records. The records, the basic addressable units available to the FORTRAN program, are numbered consecutively from zero. The

system uses the last 1% of disk storage (cylinder 99) as a table to store the record lengths and boundaries of each existing file. A utility program is used to initialize and update this table.

Before a file can be used, the record length and file boundaries must be read from the table and sent to the appropriate subroutine; this is called "opening a file." Only one file may be open at any time, and data are written on or read from the portion of the open file indicated by the record number. Regardless of the size of the data block or the record number, data are not allowed to exceed the boundaries of the open file.

For additional protection, the utility program may be used to place a file in a "read only" state. All files except "file zero" are personal files and assigned to individual users for their exclusive use. "File zero" is a common file available to all users at all times and cannot be file-protected.

The Second-Disk Subroutine Set consists of four subroutines, each written to be compatible with calling programs of any word lengths (F and K):

1. Subroutine SDDEF is used to define the Common File record length.
2. Subroutine SDKEY is used to open a file.
3. Subroutine SDREC is used to write on an open file.
4. Subroutine SDFET is used to read an open file.

The second-disk utility program is used to initialize a disk pack, to define a file, to delete a file definition, to declare a file "read only," to declare a file "read/write," and to dump the table of file descriptions.

Reference:

1. Krejci, H. F.: 1620 Monitor II-D Disk Storage Subroutines ANL-7324, Argonne National Laboratory, April 1967 (available from CFSTI, Springfield, Va. 22151, at \$3.00—microfiche, \$0.65).

(continued overleaf)

Note:

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